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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/689,131	10/12/2000	John M. Hetzel, JR.	461568-014	8089

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EXAMINER

STAIKOVICI, STEFAN

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 06/06/2002

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/689,131

Applicant(s) **QFS**

HETZEL,, JOHN M.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) 38-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 and 42-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-55 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-37 and 42-55, drawn to a process of making a composite article, classified in class 264, subclass 137.
 - II. Claims 38-41, drawn to a protective helmet, classified in class 428, subclass 34.1.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process such as forming the fiber based filler first and then impregnating with resin/ceramic mixture.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Mr. Stephen Elleman on December 7, 2001 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-37 and 42-55. Affirmation of this election must be made by applicant in replying to this Office action. Claims 38-41 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

- ✓ 5. The disclosure is objected to because of the following informalities: on page 13, line 11, “filer” should be replaced with --filler--.

Appropriate correction is required.

Drawings

- ✓ 6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: “26a” and “26b”. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- ✓ 8. Claims 1-37 and 42-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 1, 17, 23, 36 and 42, the limitation of “providing a resin mixture” is unclear as to whether said “resin mixture” is the same or different than the mixture of “thermosetting resin and ceramic particle”. It should be noted that for the purpose of

examination it has been assumed that said "resin mixture" is the same as the mixture of "thermosetting resin and ceramic particle". Claims 2-26, 18-22, 24-35, 37 and 43-55 are rejected as dependent claims.

Further clarification is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 8, 11, 17, 42, 49, 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106.

Medwell ('674) teaches the basic claimed process of forming a protective helmet including, providing a thermosetting resin impregnated fabric (fiber-based filler), positioning said thermosetting resin impregnated fabric into a mold having a male and a female mold half and molding said thermosetting resin impregnated fabric into a protective helmet under heat and pressure by curing said thermosetting resin (see col. 2, line 65 through col. 3, line 14).

Regarding claims 1, 17 and 42, Medwell ('674) do not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under

heat and pressure. Therefore, it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, JP 1-145106 specifically teaches that said ceramic particles improves impact and heat resistance, hence improves the protective characteristics of the resulting molded helmet.

In regard to claims 8 and 49, Medwell ('674) teaches a polyester thermosetting resin (see col. 3, lines 9-14).

Specifically regarding claims 11 and 52, Medwell ('674) teaches polyaramid fibers (see col. 3, lines 5-9).

11. Claims 9-10 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Hetzel, Jr. *et al.* (US Patent No. 6,098,197).

Medwell ('674) in view of JP 1-145106 teach the basic claimed process as described above.

Regarding claims 9 and 50, Medwell ('674) in view of JP 1-145106 do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet

(see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 1-145106, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 1-145106, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

12. Claims 12-13, 15 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Hastings (US Patent No. 5,794,271).

Medwell ('674) in view of JP 1-145106 teach the basic claimed process as described above.

Regarding claims 12-13, 15 and 53-55, although Medwell ('674) teaches providing additional reinforcement layers (see col. 2, lines 60-65), Medwell ('674) does not specifically teach a fiber-based sheeting, especially a woven/non-woven glass fiber sheeting. Hastings ('271)

teaches a polymeric protective helmet including, providing a non-woven glass fiber layer (32) (see col. 3, lines 6-20 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a fiber-based sheeting, especially a non-woven glass fiber sheeting as taught by Hastings ('271) in the protective helmet formed by the process of Medwell ('674) in view of JP 1-145106 because, Hastings ('271) specifically teaches that such a sheeting provides for improved impact resistance, Medwell ('674) and Hastings ('271) teach similar end-products.

13. Claims 1, 5, 8, 11-13, 15, 17-19, 23, 27, 33-36, 42, 46, 49, 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106.

Hastings ('271) teaches the basic claimed process of forming a protective helmet including providing a first layer of thermosetting resin (18) on a mold surface, placing a second layer including a fiber reinforced woven fabric (20) over said first layer of thermosetting resin (18), positioning a third layer of said thermosetting resin (22) and molding (curing thermosetting resin) said layers to form said protective helmet (see col. 2, lines 38-65). It is submitted that since Hastings ('271) teaches a molding process that a female and a male mold are taught in order to obtain a molded article as shown in Figure 1.

Regarding claims 1, 17, 23, 36 and 42, Hastings ('271) does not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under

heat and pressure. Therefore, it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, JP 1-145106 specifically teaches that said ceramic particles improves impact and heat resistance, hence improves the protective characteristics of the resulting molded helmet.

Further regarding claims 18-19, 23 and 36, it should be noted that Hastings ('271) teaches a first thermosetting resin layer (18), a fiber layer (20) and a second thermosetting layer (22) placed onto said fiber layer (20).

In regard to claims 5, 27 and 46, Hastings ('271) teaches that the epoxy layer penetrates second layer (20) to completely saturate said second layer (20) (see col. 2, line 66 through col. 3, line 5). Further, upon curing, it is submitted that "complete saturation" requires that the epoxy resin flow around the fibers and bond to the fibers during the curing process.

In regard to claims 8 and 49, Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42).

Specifically regarding claims 11 and 52, Hastings ('271) teaches aramid fibers (see col. 2, lines 50-51).

Regarding claims 12-13, 15, 33-35 and 53-55, Hastings ('271) teaches a polymeric protective helmet having a non-woven glass fiber layer (32) bonded to woven fiber layer (20) (see col. 3, lines 6-20 and Figure 3).

In regard to claim 16, Hastings ('271) teaches placing a fiber layer (20) onto a first resin layer (18) and then placing a second resin layer (22) onto said fiber layer (20). Hence, it is submitted that said fiber layer (20) is positioned in the mold prior to resin impregnation.

14. Claims 2, 20, 24, 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of JP 55-3320.

Hastings ('271) in view of JP 1-145106 teach the basic claimed process as described above.

Regarding claims 2, 20, 24, 37 and 43 Hastings ('271) in view of JP 1-145106 do not teach chopping the ceramic particles. JP 55-3320 teaches forming ceramic particles by grinding (chopping) a ceramic blank. Therefore, it would have been obvious for one of ordinary skill in the art to have formed ceramic particles by grinding (chopping) a blank as taught by JP 55-3320 in the process of Hastings ('271) in view of JP 1-145106 because, JP specifically teaches forming ceramic particles by grinding and JP teaches a process for impregnating a fabric with a mixture containing ceramic particles and thermosetting resin.

15. Claims 3-4 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of JP 11-322459.

Hastings ('271) in view of JP 1-145106 teach the basic claimed process as described above.

Regarding claims 4 and 45 Hastings ('271) in view of JP 1-145106 do not teach a ceramic content of 10 to 20 percent by weight. JP 11-322459 teaches a moldable mixture of

thermosetting resin and ceramic particles in a content of 5-30 percent by volume (approximately 10 to approximately 20 percent by weight). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a moldable thermosetting resin and ceramic particles in a content of 5-30 percent by volume as taught by JP 11-322459 in the process of Hastings ('271) in view of JP 1-145106 because, JP 1-145106 specifically teaches a moldable mixture of thermosetting resin and ceramic particles.

In regard to claims 3 and 44, it is submitted that particle size is a result-effective variable. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 1-145106 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

16. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of JP 55-3320 and JP 11-322459.

Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 teach the basic claimed process as described above.

Regarding claim 26, Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 do not teach a ceramic content of 10 to 20 percent by weight. JP 11-322459 teaches a moldable mixture of thermosetting resin and ceramic particles in a content of 5-30 percent by volume (approximately 10 to approximately 20 percent by weight). Therefore, it would have

been obvious for one of ordinary skill in the art to have provided a moldable thermosetting resin and ceramic particles in a content of 5-30 percent by volume as taught by JP 11-322459 in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 because, JP 1-145106 specifically teaches a moldable mixture of thermosetting resin and ceramic particles.

In regard to claim 25, it is submitted that particle size is a result-effective variable. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 and JP 11-322459 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

17. Claims 6-7, 9-10, 14, 28-30, 32, 47-48, 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Hetzel, Jr. *et al.* (US Patent No. 6,098,197).

Hastings ('271) in view of JP 1-145106 teach the basic claimed process as described above.

Regarding claims 9, 31 and 50, Hastings ('271) in view of JP 1-145106 do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to

form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10, 30, 32 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet. Further regarding claim 30, it should be noted that Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42). It should be noted that in claim 32, it is submitted that the catalyst is mixed with the thermosetting resin prior to being molded in order to allow homogeneous distribution of said catalyst within said thermosetting resin and as such to function as described by Hetzel, Jr. *et al.* ('197).

Specifically regarding claim 14, Hetzel, Jr. *et al.* ('197) teach a firefighter helmet having a thickness of 0.08 inches (approximately 0.09 inches) (col. 5, line 37). It would have been

obvious for one of ordinary skill to have provided a fibrous layer having a thickness of approximately 0.09 inches (0.08 inches) as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106, because Hetzel, Jr. *et al.* ('197) specifically teach that such a thickness is desirable for a protective helmet which is taught by Hastings ('271).

Regarding claims 6-7, 28-29, 47-48, it is submitted that molding time, temperature and pressure are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Further, it should be noted that Hetzel, Jr. *et al.* ('197) teach a molding temperature of 100 to 200 °F, a molding pressure of 300 to 500 psi and a molding time of 6-9 minutes (see col. 6, lines 57-68). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum molding temperature, pressure and time as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 because, Hetzel, Jr. *et al.* ('197) teach molding (curing) conditions for an epoxy thermosetting resin which is the material taught by Hastings ('271).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jan H. Silbaugh, can be reached at (703) 308-3829. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD


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June 3, 2002